What is Claimed:

1. An imaging device comprising:

a plurality of electron sensing elements for receiving energy from an electron energy source, each of said electron sensing elements including at least one respective charge collection element configured to receive and store energy from said respective energy sensing element; and

a plurality of switching elements positioned between respective ones of said plurality of energy sensing elements,

said imaging device being configured to collect energy received by at least two of said plurality of energy sensing elements in said at least one respective charge collection element of one of said at least two of said plurality of energy sensing elements through actuation of at least one of said switching elements.

2. The electron sensing imaging system of claim 1 wherein said imaging device is a functional imaging array, and said plurality of energy sensing elements are pixel elements.

3. The electron sensing imaging system of claim 1 wherein said plurality of energy sensing elements are arranged in a plurality of columns and rows, said electron sensing imaging system being configured to collect energy received by at least two of said plurality of energy sensing elements adjacent one another in one of said rows in said at least one respective charge collection element of one of said at least two of said plurality of energy sensing elements through actuation of at least one of said switching elements.

4. The electron sensing imaging system of claim 1 wherein said plurality of energy sensing elements each include a respective electron sensing planar pad.

5. The electron sensing imaging system of claim 1 wherein said plurality of energy sensing elements are pixel elements.

6. The electron sensing imaging system of claim 1 wherein said plurality of switching elements are time cycle controlled transistors.

7. The electron sensing imaging system of claim 1 wherein said plurality of charge collection elements are selected from the group consisting of capacitors and diodes.

8. The electron sensing imaging system of claim 1 wherein said electron sensing imaging system is configured to operate in either of a progressive scan mode and a snapshot pseudo-interlace mode.

9. The electron sensing imaging system of claim 8 wherein said plurality of switching elements includes a first group of switching elements and a second group of switching elements, and operation in said snapshot pseudo-interlace mode includes alternating positions of said first and second groups of switching elements with respect to one another during each of a plurality of cyclical snapshots.

10. The electron sensing imaging system of claim 1 wherein said energy received by said at least two of said plurality of energy sensing elements is collected in said at least one respective charge collection element before said energy is converted to a voltage signal configured for read-out.

11. The electron sensing imaging system of claim 1 additionally comprising at least one correlated double sampling element configured to sample a signal representing said energy collected in said at least one respective charge collection element before said energy is converted to a voltage signal configured for read-out, said correlated double sampling element removing noise from said energy collected in said at least one respective charge collection element.

12. The electron sensing imaging system of claim 11 additionally comprising another correlated double sampling element configured to store, for readout, said signal sampled by said at least one correlated double sampling element, while said at least one correlated double sampling element is utilized to sample another signal representing said energy collected in said at least one respective charge collection element during a subsequent exposure.

13. An imaging system comprising:

a photocathode for receiving energy from an energy source, said photocathode converting said energy into electrons;

a multi-channel plate for receiving said electrons from said photocathode and for multiplying and accelerating said electrons received from said photocathode;

an imaging device for receiving electrons from said multi-channel plate, said imaging device including,

a plurality of electron sensing elements for receiving a portion of said electrons from said multi-channel plate, each of said electron sensing elements including at least one respective charge collection element configured to receive and store energy from said respective energy sensing element, and

a plurality of switching elements positioned between respective ones of said plurality of energy sensing elements,

said imaging device being configured to collect energy received by at least two of said plurality of energy sensing elements in said at least one respective charge collection element of one of said at least two of said plurality of energy sensing elements through actuation of at least one of said switching elements; and

a display device for receiving and displaying an output image signal from said imaging device.

14. The imaging system of claim 13 additionally comprising at least one correlated double sampling element configured to sample a signal representing said energy collected in said at least one respective charge collection element before said energy is converted to a voltage signal configured for read-out, said correlated double sampling element removing noise from said energy collected in said at least one respective charge collection element.

15. The imaging system of claim 14 additionally comprising another correlated double sampling element configured to store, for readout, said signal sampled by said at least one correlated double sampling element, while said at least one correlated double sampling element is utilized to sample another signal representing said energy collected in said at least one respective charge collection element during a subsequent exposure.

16. A method of operating an imaging device, said method comprising the steps of:

receiving energy from an electron energy source via a plurality of electron sensing elements;

providing each of the electron sensing elements with at least one respective charge collection element configured to receive and store energy from the respective electron sensing element; and

operating a plurality of switching elements positioned between respective ones of the plurality of energy sensing elements such that energy received by at least two of the plurality of energy sensing elements is collected in the at least one respective charge collection element of one of the at least two of the plurality of energy sensing elements through said operating step.

17. The method of claim 16 further comprising the steps of:

sampling a signal representing the energy collected in the at least one respective charge collection element via at least one correlated double sampling element to remove noise from the energy collected in said at least one respective charge collection element; and

converting the sampled signal to a voltage signal configured for read-out.

18. The method of claim 17 further comprising the steps of:

storing, for readout, the signal sampled by the at least one correlated double sampling element in another correlated double sampling element, while the at least one correlated double sampling element is utilized to sample another signal representing the energy collected in the at least one respective charge collection element during a subsequent exposure.